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CHARACTERISTICS OF SMOKERS AND NON-SMOKERS

This report summarizes our activities since our first progress report of October 15, 1971.

Our initial retrievals and tabulations of all multiphasic variables for smokers and non-smokers are essentially complete. In carrying these out, we focussed on a population of about 89,000 subjects who had multiphasic examinations between 1964 and 1968, and who were classified as having white, black or yellow skin color, and who gave consistent and complete enough answers to questions about smoking that they could be classified with confidence into one of the smoking categories that we defined.

We have generated many volumes of computer output similar in format to those shown as Appendix B in our first progress report. Our efforts of late have been directed mostly towards looking at specific subject matter areas in depth, in order to present and publish our findings in a way that will be meaningful to the scientific and medical community. We have made much progress toward this goal as will be outlined below, but there is still a great deal of work to do in the future if we are to take full advantage of the Kaiser-Permanente data base in characterizing smokers and non-smokers.

The various studies that have been fully or partly completed to date are summarized below. Results that have not yet been published are presented as confidential privileged information.

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Smoking Among White, Black and Yellow Men and Women:
Kaiser-Permanente Multiphasic Health Examination Data, 1964-1968.

This basic paper provides a description of our study population and

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describes our methods for assessing and classifying smoking habits. Detailed data about smoking habits are presented according to age, sex and race breakdowns. To our knowledge, this is the first large scale U.S. study to provide information on the smoking patterns in "non-whites", subdivided into blacks and orientals.

This has been published in the American Journal of Epidemiology (96:23-35, 1972) and 20 reprints have been provided to the Council for Tobacco Research-U.S.A.

Smoking Habits and the Leukocyte Count:

This study explores in detail the relationship between smoking habits and the leukocyte count, a relationship which has been discussed very little in the literature. In our data cigarette smokers had, on the average, substantially higher leukocyte counts than non-smokers, with exsmokers and cigar and pipe smokers being intermediate. The leukocyte count was related to quantity smoked, inhalation and smoking duration. We looked at a number of variables to try to explain the smoking-leukocyte count relationship. The presence of chronic bronchitis explained a small part of the difference, but for the most part, the smoker-nonsmoker difference in leukocyte counts could not be attributed to disease or to extraneous factors. Most of the changes in leukocyte counts in persons who started and stopped smoking were consistent with an effect of smoking.

This study was presented to the Society for Epidemiologic Research, Houston, Texas, May 6, 1972. It has been accepted for publication in the Archives of Environmental Health, and is scheduled to appear in the February or March, 1973 issue.

Smoking and Drug Consumption in White, Black and Oriental Men and Women:

This study fills an important gap in knowledge about the drug usage characteristics of smokers and non-smokers. While some information has been published about drug addiction and oral contraceptive usage in smokers and

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non-smokers, little if any information is available about differences in usage of the major classes of medicinal drugs. Our analysis of questionnaire responses of smokers and non-smokers has revealed some striking differences in the percentage who take various drugs, particularly in the younger age groups.

This paper is complete and has been submitted to Clinical Pharmacology and Therapeutics.

Cigarette Smoking Habits and Serum Chemistry Tests:

Our data analysis with regard to differences between cigarette smokers in serum chemistry tests has revealed some striking and interesting differences. On the average, creatinine and albumin levels were lower in the smokers of both sexes, while the opposite was true for one-hour post-challenge serum glucose. Globulin levels were consistently lower in the women smokers only. Uric acid concentrations were lower in the men who smoked. Cholesterol levels were higher in the white men who smoked but not in the black male smokers. Calcium and SGOT levels of smokers were quite similar to those of non-smokers.

Where the serum chemistry concentrations of the smokers differed from those of non-smokers, the associations were examined for relation to 1) the interaction of other variables correlated with smoking and 2) the quantity of cigarettes smoked. In the cases of serum albumin, uric acid, and cholesterol the evidence, while not constituting proof, was consistent with the hypothesis that cigarette smoking directly caused the difference. The difference noted between smokers and non-smokers in serum glucose concentration appeared to be partially related to differences in alcohol consumption habits. In particular, it was of great interest to note that among non-drinkers, smokers did not have high serum glucose levels.

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A manuscript has been completed and is now undergoing some final editing and minor revisions. We plan to submit it to the Annals of Internal Medicine.

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Cigarette Smoking and Exposure to Environmental Hazards:

In analyzing the multiphasic questionnaire data we have noted that more cigarette smokers reported occupational exposure to environmental hazards than did non-smokers. These hazards included chemicals, gases, engine exhaust fumes, metal and plastic fumes, various dusts, extreme heat and loud noise. Since these exposures have important pathogenetic effects they should be taken into account in population studies of smoking and health. Accordingly, we plan to publish these findings. A first draft of a manuscript has been completed except for one section: we are presently interviewing a sample of multiphasic screenees to validate the questionnaire responses regarding these exposures, and to gain more insight into exactly what is involved when a person reports, for example, an exposure to loud noise.

Smoking, Hearing Loss, and Exposure to Loud Noise:

The National Health Survey found an increased prevalence of hearing loss in male heavy smokers. We also found a greater prevalence of hearing loss in smokers than in non-smokers. However, because we also noted increased exposure to loud noise among smokers (see above) it seemed important to take noise exposure into account in analyzing differences in hearing loss between smokers and non-smokers. These analyses have been completed. We have found that, compared to the much stronger relationship of hearing loss to age, sex and noise exposure, smoker-nonsmokers differences are relatively slight.

A first draft of this manuscript is mostly completed and requires only some additional review of the literature.

Smoking and Response to Health Questionnaires:

During the first year, aided by CTR support, Dr. Thomas Oakes conducted a survey of a five percent random sample of Kaiser Health Plan Members in the Oakland-Berkeley area. Some results of this survey were mentioned in our

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first published paper. In addition, other pertinent studies have been made with these data. Responses to the survey questionnaire came in by successive waves, each requiring an additional letter or other means of persuasion to gain cooperation. Thus it was possible to grade or categorize respondents according to their degree of cooperativeness in completing a health and social questionnaire. In correlating these with their smoking habits we have noted that, on the average, smokers respond less readily and promptly than non-smokers. The most cooperative group were the exsmokers. These findings suggest that there are important psychological differences between smokers, exsmokers, and non-smokers. The analysis also involves looking at cooperativeness in terms of disease status.

A first draft of this manuscript is complete and is undergoing some final editorial revisions.

Smoking and the Use of Medical Care Facilities:

Based on the same survey Dr. Oakes is completing a manuscript about the relationship of smoking to the use of medical care facilities including multiphasic checkups, other checkups, doctors' office visits and hospitalizations. Several differences were noted between smokers and non-smokers in the use of these medical care services. For example, smokers took fewer checkups than non-smokers.

A first draft of this manuscript is complete and is undergoing some final editorial revisions.

Multivariate analyses to discriminate between smokers and non-smokers:

Dr. Ury has been analysing groups of questionnaire responses in an effort to find those combinations that discriminate best between smokers and non-smokers. Work so far has focussed on the neuromental or psychological questions which, individually were the best discriminators. The methods tried so far have not proven to be very effective but others are currently being tested.

This work is important from both a methodological and subject-matter

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point of view. It would be of value to identify those combinations of characteristics that best characterize smokers. Also it will be helpful to other research workers in this area to learn which statistical methods are the most powerful.

Distinctions between Cigar and Pipe Smokers

Most studies of smoking effects have grouped cigar and pipe smokers into one category. Dr. Seltzer has recently published findings from Veterans Administration data showing some striking differences between cigar and pipe smokers regarding both body build and socioeconomic characteristics.

A detailed comparison of the characteristics of cigar and pipe smokers is now in progress using our data. This will provide a much more definitive study of the question since larger numbers of subjects are involved.

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